REMARKS

Applicants respectfully request reconsideration of this application in view of the amendments and remarks made herein.

Claims 1-45 were previously canceled and claim 56 is canceled herein. Claims 46-51, 53, 58-65 were amended and new claims 66-67 have been added. Claims 46-55 and 57-67 are pending. The claims have been amended to more particularly point out and distinctly claim the subject matter of the invention. Applicants respectfully submit that the amended claims and newly submitted claims are supported by the original disclosure of this application. As such, no new matter has been added by these amendments.

Claim Rejections

1. 35 U.S.C. § 112, first paragraph

a. Claims are Enabled to Person of Skill in the Art to Practice the Invention

Claims 46-65 are rejected under 35 U.S.C § 112, first paragraph. The Examiner alleges that although the specification, while being enabling for a method of inducing nematode resistance in a transgenic plant by introduction of a chimeric gene comprising the pokeweek antiviral protein (PAP) encoding sequences under the control of a nematode inducible promoter in a transgenic plant, does not reasonably provide enablement for a method of inducing cell death in any plant cells with the exemplified or non-exemplified pokeweek encoding nucleic acids. Additionally, the Examiner states that several attempts to transform tobacco cells with mature PAP-S sequence failed to produce transformed tobacco cells indicating that the mature PAP-S sequence does not function in tobacco plants. Further, the Examiner alleges that it unpredictable as to whether a nucleic acid that hybridizes to SEQ ID NO:1,3,5 or 7 under "any stringent" conditions will encode a functional polypeptide having the functional activity of SEQ ID NO: 2, 4, 6 or 8. The Examiner maintains that given the breath of the claims, the state of the prior art regarding the role of plant RIPs in inducing cell death; the nature of the invention; the limited working examples, and the unpredictability with respect to PAP activity in transgenic plants as discussed above, the claimed invention is not enabled throughout the broad scope.

The test for enablement is whether one reasonably skilled in the art could make or use the invention, without undue experimentation, from the disclosure in the patent coupled with information known in the art at the time the patent application was filed. *In re Wands*, 858

F.2d 731 (Fed. Cir. 1988).

Applicants have amended the claims to recite the specific stringent hybridization conditions for binding to the nucleic acid sequences of SEQ ID NO: 1, 3, 5 or 7. Thus, the claims no longer encompass nucleic acid molecules that hybridizes to SEQ ID NO: 1, 3,5 or 7 under "any stringent" conditions. Further, the claims specify that the nucleic acid molecule encodes a pokeweed antiviral protein that is capable of inducing cell death. The amended claims are enabled as they possess both a structural and functional element and, as such, enable one of skill in the art to practice the invention.

Applicants maintain that support for the amended claims can be found on p. 11, line 16 through p. 12, line 10 of the specification, which discloses stringent hybridization conditions that may be used to isolate additional sequences encoding a pokeweed antiviral protein having ribosome inactivating activity that, by virtue of that activity, is capable of inducing cell death. Furthermore, the working examples of the specification describe an assay based on GUS protein synthesis for confirmation that the isolated nucleic acid molecule encodes a protein with ribosome inactivating activity. Applicants maintain that given that the specification discloses SEQ ID NO.: 3, 5 and 7 and stringent hybridization conditions, coupled with working examples that describe assays for detecting ribosome inactivating activity, undue experimentation would not be required by one of ordinary skill in the art to develop the methods encompassed by the full scope of the claims for inducing cell death in specific cells of a plant.

The Examiner alleges that the specification fails to provide any working examples demonstrating the induction of plant cell death through expression of pokeweed encoding nucleic acids. In this regard, the Examiner's attention is respectfully invited to the working examples of the specification, which clearly demonstrate that expression of Pro-PAP-S in both tobacco and potato plants at the site of nematode feeding led to differences in nematode size and resistance. (See,¶¶ 0159-0176) Specifically, in tobacco plants expressing the Pro-PAP-S a decrease in the size of the infecting nematodes was observed. In potatoes fewer cysts, which is an indication of nematode resistance, were observed. Applicants assert that the observed differences in the size of the infecting nematodes and the decrease in the number of cysts is an indication that plant cell death is occurring. In fact this is exactly the result the specification teaches. Specifically, the specification discloses "[b]y targeting the nematode site a nematode resistant plant may be obtained. By the term "nematode resistant plant" it is meant a plant which upon infection by plant parasitic nematodes is capable of

preventing, slowing or otherwise adversely affecting the growth and development of nematodes that attack the plant..." (See, ¶0058).

With regard to the Examiner's comments regarding the inability to transform tobacco with nucleic acids encoding the mature PAP-S, it is noteworthy that Applicants were nevertheless able to generate transgenic tobacco plants expressing the Pro-PAP-S protein. Moreover, the generation of such transgenic tobacco plants was accomplished using the very methods disclosed in the specification.

Accordingly, Applicants respectfully submit that these and all pending claims satisfy the enablement requirement of 35 U.S.C. § 112, first paragraph. Applicant respectfully request that this ground of rejection be withdrawn.

b. Invention Is Adequately Described in the Specification

The Examiner has rejected claims 46-65 as not being adequately described in the specification in such a way to convey to one skilled in the art, at the time the application was filed, that Applicants had possession of the claimed invention. The Examiner alleges that it is unpredictable as to whether a nucleic acid that hybridizes to SEQ ID NO:1, 3, 5 or 7 under "any stringent" conditions will yield nucleic acids that are structurally and functionally related to SEQ ID NO: 1,3,5 or 7. Additionally, the Examiner asserts that Applicants have not described a structural property that relates the disclosed sequences to cell death inducing activity.

Factors to be considered in determining whether there is sufficient written description include the level of skill and knowledge in the art, partial structure, physical and/or chemical properties, functional characteristics alone or coupled with a known or disclosed correlation between structure and function and method of making the claimed invention. Where the specification discloses relevant identifying characteristics, i.e., physical, chemical and/or functional characteristics, sufficient to allow a skilled artisan to recognize that the applicant was in possession of the claimed invention, a rejection for lack of written description under Section 112, first paragraph, cannot be maintained. *Enzo Biochem, Inc. v. Gen-Probe, Inc.*, 323 F.3d 956 (Fed. Cir. 2002).

Applicants have amended the claims to recite the specific stringent hybridization conditions for binding to the nucleic acid sequences of SEQ ID NO: 3, 5 or 7. Thus, the claims no longer encompass nucleic acid molecules that hybridizes to SEQ ID NO: 3,5 or 7 under "any stringent" conditions. Further, the claims specify that the nucleic acid molecule encodes a pokeweed antiviral protein that induces cell death. As such, the amended claims

satisfy the written description requirement as they possess both a structural and functional element.

Regarding the Examiners assertion that Applicants have not described a structural property that relates the disclosed sequences to cell death, it should be noted that pokeweed antiviral protein having ribosome inactivating activity is, by virtue of that activity, capable of inducing cell death. In fact, as demonstrated in the working examples, expression of PAP proteins in transgenic tobacco and potato plants had an effect on infecting nematode size and resistance which is an indirect indication of cell death.

Applicants submit that, given the teachings of the specification of both structural and functional features of pokeweed proteins encompassed by the claims, a sufficient written description has been provided. Therefore, the rejection is erroneous and Applicants respectfully request withdrawal of the rejections of these and all pending claims under 35 U.S.C. § 112, first paragraph.

2. 35 U.S.C. § 112, Second Paragraph

Claims 46-65 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicants have amended the rejected claims to more particularly point out and distinctly claim the subject matter that applicants regard as their invention.

According to the Examiner, claims 46-50, 56, 59-60 and 63-65 are indefinite because it is unclear what is encompassed by " allowing natural development of a plant" or how to allow "natural development" of a plant. Applicants have amended the claims to read, e.g. in claim 46, that an inducible promoter is a promoter "which induces expression of said pokeweed antiviral protein in said specific cells upon exposing of said plant to said pathogen or said chemical or which is cell type specific and induced during natural plant development."

According to the Examiner, claim 56 is indefinite because "said specific cells" and "said plant" in part (ii) lack antecedent basis. Claim 56 has been canceled without prejudice.

According to the Examiner, claims 47-49 and 53 are indefinite for failing to recite specific hybridization conditions. In response, applicants have amended the claims to specify stringent hybridization conditions.

According to the Examiner, claims 47-50, 53 and 60 are indefinite because the phrase "capable of inducing cell death" renders the claims indefinite. Applicants have replaced the phrase "capable of inducing" with "that induces."

According to the Examiner, claim 51 is indefinite because it is unclear if there is more than one " Pro-PAP-S" and claim 58 is indefinite because it is unclear if there is more than one of each of the recited PAP proteins. Applicants have amended claim 51 to indicate that the "precursor PAP molecule is a Pro-PAP-S protein" and amended claim 58 to specify that "the pokeweed antiviral protein is a mature pokeweed antiviral protein, a mature PAP-S protein, a pro-PAP-S protein, a PAP-S β protein, or PAP-S α protein."

According to the Examiner, claim 60 is indefinite for lacking a correlation between the preamble and the last method step. Applicants have amended claim 60 to encompass "a method of inducing ***cell death***."

According to the Examiner, claim 61 is indefinite because the phrase "the inducible pathogen" lacks antecedent basis. Applicants have amended the claim to delete "inducible."

Applicants assert that all pending claims satisfy the requirements 35 U.S.C. § 112, second paragraph.

3. Claims are Not Obvious Over Cited Art

The Examiner rejected claim 56 under 35 U.S.C. § 102 (b) as being anticipated Kanieswski *et al.* (U.S. Patent No. 6,015,940, hereafter "Kanieswski"). To expedite the allowance of this application, Applicants have canceled claim 56, without prejudice to the prosecution of this subject matter in a separate continuing application. Accordingly, applicants respectfully request withdrawal of this ground of rejection.

4. New Claims 66 and 67

Applicants have added new claims 66 and 67, not taught in the art, drawn to a molecule comprising a nucleic acid molecule encoding a mature PAP-S α protein (claim 66) and mature PAP-S β protein (claim 67), respectively, and an inducible promoter which induces expression of the mature PAP-S α protein (claim 66) and mature PAP-S β protein (claim 67), respectively, in cells of a plant upon exposing the plant to a pathogen or a chemical or which is cell type specific and induced during natural plant.

CONCLUSION

Applicants respectfully submit that all pending claims 46-55 and 57-67 of this application are presently in condition for allowance. Prompt and favorable reconsideration and allowance of all pending claims is respectfully requested.

The Commissioner is authorized to charge any fees relevant to this filing to Deposit Account No. 11-0600. The Examiner is invited to contact the undersigned to discuss any matter in this application.

Respectfully submitted,
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